

REMARKS

Claims 1-9 are pending in this application, with Claims 1 and 5 being independent. Claims 1 and 5 are amended herein to recite the feature that the ink comprises water at a content of 30 to 70 weight percent based on the total weight of the ink. Support for the amendment can be found in the specification at least at page 20, line 27 to page 21, line 2 and in the examples. Applicants respectfully submit that no new matter has been added by the amendments herein.

Claims 1, 3-5 and 7-9 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over Kato et al. (U.S. Patent No. 5,538,549) in view of Tanuma et al. (U.S. Patent No. 6,166,122). Claims 2 and 6 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over the same two references and further in view of Kondo et al. (U.S. Patent No. 6,000,794). Applicants respectfully disagree with these rejections as applied to the claims as currently presented.

Before addressing the merits of the rejections, Applicants believe it will be helpful to review some features, and advantages of the present invention. The present invention, as recited in Claim 1, relates to an ink-jet recording system comprising a recording medium, an ink-jet printing apparatus comprising ink containers in which a plurality of pigment inks are contained, and ink-jet heads for ejecting the respective pigment inks toward the recording medium. The recording medium is provided with an ink-receiving layer having porous structure on a base material. The ink-receiving layer comprises alumina hydrate particles and resinous binder, and has a pore volume of 0.1 to 1.0 ml/g. The ink-receiving layer has a thickness of at least 15 μm . Each of the pigment inks comprises pigment particles and a resin in an aqueous medium, and comprises 30 to 70% water by weight based on the total weight of the ink. In each

of the pigment inks, the diameter of the pigment particles falls within a range of from 10 to 500 nm, and the proportion of the pigment particles having a diameter of 300 to 500 nm based on the total number of pigment particles in the ink is at most 30%. Independent Claim 5 relates to an ink-jet recording method of similar scope.

The claimed ink-jet recording system and method provide excellent coloring ability and ink absorbency, as well as improved rub-off resistance and water-fastness, by employing a recording medium having specific properties in combination with an aqueous pigment ink having specific properties. The combination of a specific recording medium and a specific ink is a feature of the invention, and the advantages of this combination are demonstrated in the examples in the specification.

When the water content of the ink is too high, the ink does not sufficiently penetrate into the recording medium because of the increased evaporation rate of the ink. Therefore, the rub-off resistance and the saturation of the produced image will be decreased.

In Applicants' view, the cited references do not teach or suggest the claimed invention.

Kato et al. discloses a pigment ink, but it contains water at a content of 79 weight percent. (See Tables 1-6.) Moreover, Kato et al. provides very little description of the recording medium. The recording medium described in the examples is merely referred to as "L type" paper. See col. 9, line 42 and col. 10, line 31. Applicants submit that this is a plain paper and does not satisfy the claimed requirements for the recording medium of the present invention, and that the "L type" recording medium has no alumina-containing layer. Applicants therefore

conclude that there is no teaching in this reference to combine a specific ink with a specific recording medium.

Tanuma et al. discloses a recording medium having a pore volume of 0.3 to 2.0 cc/g (ml/g). (Col. 3, line 45.) This upper limit for the pore volume is twice as high as that of the recording medium used in the present invention, and is even higher than the pore volume in the comparative example (i.e., 1.7 ml/g). (See page 20, line 19 of the specification.) Moreover, Tanuma et al. does not disclose any inks. Accordingly, it does not provide any teaching about water content of ink, or any teaching about combining a specific recording medium with a specific ink.

Kondo et al. is cited for disclosing a recording medium having a BET specific surface area in the range of 50 to 500 m²/ml. The total pore volume is preferably within the range of from 0.1 to 1.0 ml/g. (Col. 5, lines 3-7.) Applicants note, however, that the examples of Kondo et al. contain water at a content of 75 weight percent, which is outside of the claimed range of the present invention. Accordingly, it does not remedy the deficiencies of the Kato et al./Tanuma et al. combination.

Applicants conclude that the cited references do not render obvious the claimed invention, and respectfully request that the Section 103 rejections be withdrawn.

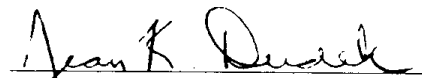
Applicants submit that the present invention is patentably defined by independent Claims 1 and 5 for the reasons discussed above. The dependent claims are also submitted to be patentable for the same reasons as their respective independent claims and because they set forth additional aspects of the present invention. Individual consideration of each dependent claim is requested.

Applicants also respectfully request that this Amendment After Final Rejection be entered. This Amendment could not have been presented earlier as it was earnestly believed that the claims on file would be found allowable. Given the Examiner's familiarity with the application, Applicants believe that a full understanding and consideration of this Amendment would not require undue time or effort by the Examiner. No new claims have been added. Moreover, for the reasons discussed above, Applicants submit that this Amendment places the application in condition for allowance. At the very least, it is believed to place the application in better form for appeal. Accordingly, entry of this Amendment is believed to be appropriate and such entry is respectfully requested.

Applicants request favorable reconsideration, withdrawal of all rejections and early passage to issue of the above-identified application.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,


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